

Appn. No. 10/762,124  
Amdt. dated: April 6, 2005  
Reply to Office Action dated January 13, 2005

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Original) A method for embedding optical band gap (OBG) devices in a ceramic substrate comprising the steps of:  
pre-forming an OBG structure;  
coating the OBG structure with a surface binding material;  
inserting the OBG structure into the ceramic substrate; and  
performing firing operations on the ceramic substrate.
2. (Original) The method according to claim 1, wherein said step of inserting the OBG structure comprises inserting the OBG structure into a via formed within the ceramic substrate.
3. (Original) The method according to claim 1, wherein said step of performing firing operations on the ceramic substrate comprises the steps of:  
pre-firing the ceramic substrate at a first temperature for a first duration of time;  
sintering the ceramic substrate at a second temperature for a second duration of time; and  
sintering the ceramic substrate at a third temperature for a third duration of time.
4. (Original) The method according to claim 1, further comprising the step of slow cooling the ceramic substrate after said step of performing firing operations.
5. (Original) The method according to claim 1, wherein the surface binding material comprises calcium.
6. (Original) The method according to claim 5, wherein the surface binding material further comprises hexane.

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7. (Original) The method according to claim 6, wherein a ratio of the calcium to the hexane is from about 1% to 2%.

8. (Original) The method according to claim 1, wherein said step of pre-forming the OBG structure comprises pre-forming the OBG structure from at least one material selected from the group consisting of indium phosphide and indium gallium arsenide.

9. (Original) The method according to claim 1, wherein the ceramic substrate comprises a plurality of substrate layers.

10. (Original) The method according to claim 1, wherein the ceramic substrate comprises low temperature co-fired ceramic.

11. (Canceled)

12. (Currently amended) The ceramic substrate of claim 11 14, wherein said OBG structure is disposed within a via in said ceramic substrate.

13. (Canceled)

14. (Currently amended) The A ceramic substrate of claim 13, wherein said comprising an OBG structure having a surface coating of a surface binding material further comprises, said OBG structure being disposed in said ceramic substrate, wherein said surface binding material comprises hexane and calcium.

15. (Original) The ceramic substrate of claim 14, wherein a ratio of the calcium to the hexane is from about 1% to 2%.

16. (Currently amended) The ceramic substrate of claim 11 14, wherein said OBG structure comprises at least one material selected from the group consisting of indium phosphide and indium gallium arsenide.

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17. (Currently amended) A The ceramic substrate of claim 14 comprising an OBG structure having a surface coating of a surface binding material, said OBG structure being disposed in said ceramic substrate, wherein said ceramic substrate comprises a plurality of substrate layers.

18. (Currently amended) A ceramic substrate of claim 14 comprising an OBG structure having a surface coating of a surface binding material comprising hexane, said OBG structure being disposed in said ceramic substrate, wherein said ceramic substrate comprises low temperature co-fired ceramic.

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